AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior version and listings of claims in the application:

Listing of Claims:

1. (Currently amended): A method for discriminating an agent, comprising the steps of:

    (a) constructing a decision tree having a plurality of branches, each branch corresponding to at least one defined action, wherein each branch comprises a plurality of successive branches, each successive branch corresponding to the at least one defined action;

    (b) providing a conditioned environment sensitive to the agent;

    (c) obtaining data from response of the agent to the conditioned environment;

    (d) extracting features from the obtained data;

    (e) selecting a branch from the decision tree corresponding to the features;

    (f) performing on the features the at least one defined action corresponding to the branch;

    (g) producing a classification of the agent;

    (h) iteratively repeating steps of (d)-(g) until the agent is discriminated <u>with a desired corresponding confidence level</u>; and

    (i) storing the classification of the agent for use,

    <u>wherein the method steps are performed by a controller.</u>

2. (Canceled).

3. (Canceled).

4. (Original): The method of claim 1, wherein the agent comprises a biological agent.

5. (Canceled).

6.   (Original): The method of claim 1, wherein the constructing step comprises the step of choosing logic for successive refinement of agent classification.

7.   (Canceled).

8.   (Previously presented): The method of claim 6, wherein the choosing step comprises the step of selecting logic for classification of a viral agent.

9.   (Original): The method of claim 1, wherein the providing step comprises the step of selecting of cell types to be exposed to the agent.

10.   (Original): The method of claim 9, wherein the providing step further comprises the step of placing at least one cell of the selected cell types in the conditioned environment.

11.   (Canceled).

12.   (Canceled).

13.   (Original): The method of claim 1, wherein the selecting step comprises the step of selecting of a branch corresponding to at least one desired feature extraction algorithm from at least one library of algorithms.

14.   (Previously presented): The method of claim 1, wherein the producing step comprises the steps of:
        (a)   determining a classification method from a library of classification methods; and
        (b)   applying the classification method to the features to produce the classification.

15-27. (Canceled.)

28.   (Currently amended): A method for discriminating an agent, comprising the steps of:

    (a)   providing a plurality of L parameters, L being an integer, each parameter being related to the status of the agent;

    (b)   fitting the plurality of L parameters into a set of ith order differential equations, i = 1, . . ., N, N being an integer;

    (c)   obtaining a plurality of L features corresponding to L parameters, respectively, from the set of ith order differential equations;

    (d)   separating the L features into a plurality of classes with a corresponding confidence level;

    (e)   providing a plurality of L+1 parameters, each parameter being related to the status of the agent;

    (f)   fitting the plurality of L+1 parameters into a set of ith+1 order differential equations;

    (g)   obtaining a plurality of L+1 features corresponding to L+1 parameters, respectively, from the set of ith+1 order differential equations;

    (h)   separating the L+1 features into a plurality of classes with a corresponding confidence level;

    (i)   iteratively repeating steps (e)-(h) until a plurality of classes for the agent is separated with a desired corresponding confidence level; and

    (j)   storing the plurality of classes for the agent for use,
wherein the method steps are performed by a controller.

29.   (Canceled).

30.   (Canceled).

31.   (Original): The method of claim 28, wherein the agent comprises a biological agent.

32.   (Canceled).

33.   (Original): The method of claim 28, wherein the parameters comprises a plurality of measurable physical quantities.

34.   (Original): The method of claim 33, wherein the plurality of measurable physical quantities comprises measurable physical quantities related to metabolic status of a biological agent.

35.   (Original): The method of claim 28, wherein the set of ith order differential equations comprises a set of 1st order differential equations of metabolic pathways, signaling pathways, or gene expression interactions.

36.   (Original): The method of claim 35, wherein the set of ith+1 order differential equations comprises a set of 2nd order differential equations of metabolic pathways, signaling pathways, or gene expression interactions.

37.   (Original): The method of claim 28, wherein each of the separating steps (d) and (h) comprises the step of separating corresponding features into a plurality of classes with one of a Principal-Component-Analysis/Cluster separation and a singular value decomposition.

38-47. (Canceled.)

48.   (Currently amended): A method for discriminating an agent, comprising the steps of:
    (a)   providing a broad spectrum assay having a plurality of L cell lines, L being an integer, each cell line being able to respond to the agent;
    (b)   measuring responses of cell line i, $i = 1, \ldots, L$, to the agent;
    (c)   separating the responses into class m, $m = 1, \ldots, O$, O being an integer and the total number of available classes, with a corresponding robustness factor;
    (d)   selecting cell line j, $j = 1, \ldots, L$ but $\neq i$, from the knowledge of class m;
    (e)   measuring responses of cell line j, $j = 1, \ldots, L$ but $\neq i$, to the agent;

(f)   defining a set of feature extraction algorithms from the measured response of cell line j, j = 1, . . ., L but ≠ i;

(g)   selecting cell line k, k = 1, . . ., L but ≠ i and ≠ j;

(h)   measuring responses of cell line k, k = 1, . . ., L but ≠ i and ≠ j, to the agent;

(i)   separating the responses into class n, n = 1, . . ., O, O being an integer and the total number of available classes, with a corresponding robustness factor;

(j)   iteratively repeating steps (f)-(i) until a class for the agent with a desired robustness factor is obtained; and

(k)   storing the obtained class for the agent for use,

wherein the method steps are performed by a controller.

49.   (Canceled).

50.   (Canceled).

51.   (Original): The method of claim 48, wherein the agent comprises a biological agent.

52.   (Canceled).

53.   (Original): The method of claim 48, wherein each of the separating steps (c) and (i) comprises the step of discriminating the responses with a Maximum Likelihood Estimator.

54.   (Original): The method of claim 48, wherein the selecting step (d) comprises the step of selecting the cell line according to a desired sensitivity of the cell line.

55.   (Original): The method of claim 48, wherein the defining step (f) comprises the step of using a classifier to define a set of feature extraction algorithms from the measured response.

56.   (Original): The method of claim 55, wherein the classifier comprises a threshold.

57-65. (Canceled.)

66.   (New):   A method for discriminating an agent, comprising the steps of:

        (a)   providing a controller programmed to perform the steps of:

                (i)   constructing a decision tree having a plurality of branches, each branch
                        corresponding to at least one defined action, wherein each branch
                        comprises a plurality of successive branches, each successive branch
                        corresponding to the at least one defined action;

                (ii)   providing a conditioned environment sensitive to the agent;

                (iii)   obtaining data from response of the agent to the conditioned environment;

                (iv)   extracting features from the obtained data;

                (v)   selecting a branch from the decision tree corresponding to the features;

                (vi)   performing on the features the at least one defined action corresponding to
                        the branch;

                (vii)   producing a classification of the agent;

                (viii) iteratively repeating steps of (d)-(g) until the agent is discriminated with a
                        desired corresponding confidence level; and

                (ix)   storing the classification of the agent for use; and

        (b)   providing a memory device in communication with the controller for storing the
                classification of the agent.

67.   (New): The method of claim 1, further comprising the step of providing a memory
device in communication with the controller for storing the classification of the agent.

68.   (New): The method of claim 1, wherein the desired corresponding confidence level is at
least 90 percent.

69.   (New): The method of claim 1, wherein the method steps are performed by a controller and the classification of the agent is stored in a memory device in communication with the controller.

70.   (New): The method of claim 28, further comprising the step of providing a memory device in communication with the controller for storing the plurality of classes for the agent.

71.   (New): The method of claim 28, wherein the desired corresponding confidence level is at least 90 percent.

72.   (New): The method of claim 48, further comprising the step of providing a memory device in communication with the controller for storing the obtained class for the agent.

73.   (New): The method of claim 48, wherein the desired robustness factor is at least 80 percent.